269177

Work Plan
Utility and Pipeline Investigation

Hartford Area Hydrocarbon Plume Site
Hartford, Illinois

Clayton Project No. 15-03095.14.004
June 29, 2004

Prepared for:
THE HARTFORD WORKING GROUP
Hartford, Illinois

Prepared by:
CLAYTON GROUP SERVICES, INC.
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VIA OVERNIGHT DELIVERY

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JUN 29 2004
Corrective Action Section
Waste Management Branch
Waste, Pesticides and Toxics Division
U.S. EPA - Region 5

June 29, 2004

Mr. Kevin Turner
USEPA REGION V
Emergency Response Branch
8588 Rt. 148
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Mr. Steven Faryan
USEPA REGION V
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HSE-5J
77 West Jackson Blvd.
Chicago, IL 60604-3590

Clayton Project No. 15-03095.14-004

Subject: **ILR000128249 LPC 1190505040 – Madison County**
The Hartford Area Hydrocarbon Plume Site / Hartford, Illinois
Work Plan – Utility and Pipeline Investigation

Dear Messrs. Turner and Faryan:

Clayton Group Services, Inc., on behalf of the Hartford Working Group (HWG), and in accordance with paragraph 52 of the Administrative Order on Consent, is submitting the Work Plan for the utility and pipeline investigation. It should be noted that this plan does not propose any new investigative work from that which is already in process or will be shortly. The purpose of the utility and pipeline investigation is to investigate free phase hydrocarbon and vapor infiltration into and/or along those utilities and pipelines. Work already underway or to be started shortly (i.e. the FPH field investigation to confirm and supplement the CPT/ROST investigation, the installation of a series of vacuum monitoring points associated with the new vapor control borings, and the vapor migration pathway assessment) will provide information that will meet the intent of paragraph 52 of the AOC.

Please contact me with any questions.

Sincerely,

Monte M. Nienkerk

Monte M. Nienkerk, P.G.
Senior Project Manager
Environmental Services

Enclosure: Work Plan – Utility and Pipeline Investigation

cc: Hartford Working Group
Robert Egan (USEPA, Region 5 – 1 copy)
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Utility and Pipeline Investigation

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Hartford, Illinois

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CONTENTS

Figures

1.0 INTRODUCTION/PURPOSE

Paragraph 52 of the Administrative Order on Consent (AOC) with the United States Environmental Protection Agency (USEPA) in the matter of The Hartford Area Hydrocarbon Plume Site (Docket No. R7003-5-04-001) requires the preparation of this Utility and Pipeline Investigation Work Plan (Plan). Clayton Group Services, Inc. was retained by The Hartford Working Group (HWG) to prepare the Plan.

It should be noted that this plan does not propose any new investigative work from that which is already in process or will be shortly. The purpose of the utility and pipeline investigation is to investigate free phase hydrocarbon (FPH) and vapor infiltration into and/or along those utilities and pipelines. Work already underway or to be started shortly (i.e. the FPH field investigation to confirm and supplement the CPT/ROST investigation, the installation of a series of vacuum monitoring points associated with the new vapor control borings, and the vapor migration pathway assessment) will provide information that will meet the intent of paragraph 52 of the AOC.

Figure 1-1 shows the general location of Hartford, Illinois (Hartford). The Plan presents the known information and data available at the time of preparation of the document regarding the physical setting and identifies all utilities and pipelines (both active and inactive) to the maximum extent practicable or possible within the site.

The Hartford site boundaries have been defined by the USEPA as being bounded by Rand Avenue to the north, the nearest railroad tracks to the east side of Olive Street to the east, Donna Drive and the south boundary of Hartford Park to the south, and Illinois State Highway 3 to the west. The Hartford site boundaries are presented in Figure 1-1. The Hartford site boundaries may differ from the Hartford corporate boundaries.

2.0 SITE DESCRIPTION

2.1 LOCATION

Hartford, Illinois is located in Madison County on the east bank of the Mississippi River upstream from St. Louis, Missouri. Hartford lies approximately 3,000 feet east of the Mississippi River. The Shell Tannery Property and the Premcor Refining Group (Premcor) facility are located directly east of Hartford. The BP Amoco (fka Amoco) facility lies north-northeast of Hartford across Rand Avenue. The ConocoPhillips (fka Shell) facility is located east of the Premcor facility. Figure 1-1 shows the respective property boundaries of these facilities and their geographical relationship to Hartford.

2.2 SITE HISTORY

Background information regarding Hartford has been discussed most recently in the *Investigation Plan to Define the Extent of Free Phase and Dissolved Phase Hydrocarbons in the Village of Hartford, Illinois* (Clayton, 2004). The following historical summary of environmental concerns was excerpted from this document.

Odor issues dating back to May 1966 have been documented in buildings in the northern portion of Hartford. In 1978, investigations were conducted because of a series of residential house fires and building odor complaints. The investigations identified the presence of FPH beneath the northern portion of Hartford. Additional investigations over the years have also identified numerous underground and aboveground petroleum pipelines in Hartford and the immediate vicinity.

In general, the concerns have been located within an area bounded by Hawthorne Street to the south, Olive Street to the east, Illinois State Highway 3 to the west, and Rand Avenue to the north.

In June 1978, Clark Oil Corporation (Old Clark), the former owner and operator of the Premcor facility, installed a FPH recovery well (RW-1) east of North Delmar Avenue at Forest Street. In 1979, Old Clark installed a second product-skimming recovery well (RW-2) west of North Olive Street between East Date and East Cherry Streets. In September 1992, Premcor (then known as Clark Refining & Marketing, a different company than Old Clark) installed a Vapor Control System (VCS) in the northern portion of Hartford to address the identified problems. Premcor also installed product recovery well RW-3 sometime in the early-1990s. The locations of the three product recovery wells in Hartford are shown in Figure 2-1.

2.3 PHYSICAL SETTING

The geologic and hydrogeologic setting of this area has been presented most recently in the Clayton (2004) Investigation Plan and is briefly summarized below. The geographical region around Hartford and other nearby towns is collectively known as the American Bottoms, which is a shallow valley 30 miles long and 11 miles across at its widest point (Engineering-Science 1992).

The present landscape and the upper 130 feet of the Hartford area were created by processes (alluvial and glacial) active during the last 125,000 years. The Mississippi River, the dominant creator of the local landscape, frequently changed its course during the Pleistocene. During the Pleistocene period, the valley was filled with sandy glacial outwash known as the Mackinaw Member of the Henry Formation (Engineering-Science 1992). The Mackinaw sands range from 60 to 150 feet in thickness and comprise what is known as the Main Sand (Main Aquifer). The upper portion of the Main Sand consists primarily of fine-grained sand.

The uppermost geologic unit is the Cahokia Alluvium of Holocene Age, which consists of sands, silts, and clays of floodplain, channel, and modern river origin (Engineering-

Science 1992). In recent times, the Mississippi River has reworked the upper part of the valley fill in migrating across the broad bottomlands, while spreading floodwaters deposited silt and clay along the sides of the channel and in backwater areas. The channel migration, cut-and-fill, and flooding have produced complex heterogeneous deposits.

The primary findings of the FPH CPT/ROST™ investigation (Clayton 2004) indicate the presence of an alluvial veneer of silts and clays overlying the areally extensive Main Sand. The alluvial silts and clays generally thicken in an easterly direction from Old St. Louis Road towards North Olive Street. A similar thickening occurs in a northerly direction from Hawthorne Avenue to Rand Avenue. As these alluvial deposits thicken to the north and east, three distinguishable permeable strata (EPA, Rand and North Olive) are found within these deposits. The more permeable strata exhibit significant spatial variability, ranging from sand with clay and silt, to silt with sand and clay. The units are separated by less permeable silty clays and clayey silts.

To the south of Watkins Street, the four strata combine into one hydrostratigraphic unit, the Main Sand. However, the exact extent and continuity of relatively thin units (such as the EPA, Rand, and North Olive Strata) remain somewhat uncertain because of geologic heterogeneities related to the depositional environment of the area.

2.4 UNDERGROUND UTILITIES/PIPELINES IN AND ADJACENT TO HARTFORD

A sequential process was used to identify and locate underground utilities and pipelines in Hartford. This consisted of efforts to identify all known features, confirming them through a series of field observations and joint utility locating meetings, and refining the true locations and sizes of them through the same meetings. Every effort was made to contact and research all known sources to identify and locate all existing and abandoned utilities/pipelines to the maximum practicable extent. Sources are considered members of

JULIE, Inc. (Joint Utility Locating Information for Excavators) which provides a free service in Illinois through a single toll-free phone number (1-800-892-0123) to call for the locating and marking of underground utility facilities. JULIE serves as a message handling service for utilities, taking information about planned excavations and distributing this information to its utility membership. It is the responsibility of each utility to mark the location of their own underground facilities at the excavation site. JULIE, also known as the "Illinois One-Call System", was formed in 1974 by the owners and operators of underground utility facilities as a means of reducing damage to those facilities. In Clayton's opinion, on behalf of the HWG, it is unlikely, based on the intent of JULIE, that any further significant information would be available from any previous owners/operators of utilities and pipelines.

Initial identification of pipelines and industrial sewers occurred from December 2003 through February 2004. This was performed by obtaining plans and drawings from the Premcor facility and through a document search of the Illinois Environmental Protection Agency (Illinois EPA) records. Each of the provided drawings was reviewed for any pipelines and industrial sewer lines. The features found were incorporated into the ongoing Geographic Information System (GIS) Hartford database and plotted on a map of the area.

A field verification of the above findings was performed in February and March 2004 by Clayton staff using the visual identification of pipeline markers. The pipeline marker coordinates were then located by a global positioning system (GPS). This allowed for an update of the actual pipeline locations to be accurately entered into the GIS database.

Joint utility locate meets, through the JULIE one-call system, were conducted on May 5 and May 13, 2004 in Hartford to further aid the verification of the pipeline information contained in the GIS database. This was a three part effort to: confirm the existence of the features found from the drawing review, add or delete features based on the

knowledge of the representatives of the companies present, and to refine the locations of the known pipelines. Several of the pipeline companies including Platte/Terasen Pipeline, St. Louis Pipeline, Centerpoint Energy (Mississippi River Transmission) and Conoco Phillips Wood River Terminal, provided maps of their pipelines in and around the Hartford area. Several companies confirmed, added, deleted, or refined the locations of pipelines present including Shell River Terminal, Marathon Ashland Pipeline, Arco/Sinclair, BOC Gases, Laclede Pipeline, Explorer Pipeline, SM&P Utility Resources, Inc. (on behalf of Premcor), and Koch Pipeline. Figure 2-2 presents the pipelines and industrial sewers identified in Hartford, Illinois and the immediate surrounding area.

Initial identification of underground utilities within Hartford occurred from January through March 2004. Maps and drawings of the sewer and water main lines were provided by the Village of Hartford in January 2004. These drawings were scanned into the GIS database and plotted on several aerial photographs of Hartford.

A series of joint utility locate meetings, through the JULIE one-call system, were conducted in January and February 2004. Companies with underground utilities present in the northern portion of Hartford included; Illinois Power, Union Electric (both represented by Great Plains Locating Service, Inc.), The Village of Hartford, the Premcor facility, (represented by SM&P), Level 3 Communications, Sprint, and SBC/Ameritech. The underground utilities present within the northern portion of Hartford were marked by the respective utility company representatives with flagging or spray paint. Clayton staff then field surveyed each of the utility markings, which included water mains and laterals, sanitary/storm sewer mains, natural gas mains and laterals, media lines, and vapor control system lines, and located their coordinate position with a GPS unit. Additional information for both utilities and pipelines was obtained from a land surveyor, Crawford, Murphy & Tilly, Inc. (CMT), who has performed a significant amount of both legal and control surveys in Hartford. This information was then incorporated into the GIS

database and plotted on several aerial photographs of Hartford. Clayton also located the coordinate positions of permanent utility markers such as fire hydrants, media boxes, water shut-off valves, sewer clean-outs, manholes, and sewer grates using the GPS unit.

The Village of Hartford representatives were unable to locate and mark the sewer laterals within the northern portion of Hartford. In an attempt to locate and mark the sewer laterals to individual structures as accurately as possible, Clayton contracted a private utility locator, Lucky Locators to conduct this work. The marking coordinates were subsequently located with the GPS unit. Clayton is also currently reviewing a sewer video survey, conducted in 2003 by Walden Technologies for Hartford, to further confirm the locations of the sewer laterals, where possible.

In April and May 2004, Clayton conducted various events to enhance the pipeline and utility information in the GIS database. The first event included additional surveying and collection of GPS coordinates by Clayton staff to fill in data gaps present in the GIS database. A joint utility locate meeting was conducted in Hartford on May 13, 2004 to further aid in the verification of the GIS database. Utility representatives in attendance confirmed the existence of the features found from the drawing review, answered questions pertaining to utility locations, and refined the locations of the known utilities. The additional information from these efforts was also incorporated into the GIS database and plotted on several aerial photographs of Hartford. Figure 2-3 presents utility infrastructure identified in the northern portion of Hartford, Illinois (primarily the area underlain by free phase hydrocarbons). Due to the scale of the map, only the utility main lines are shown. Service lines to individual properties are not shown even though they have been identified and located to the maximum extent practicable. The service lines are incorporated in the GIS database.

3.0 PIPELINE AND UTILITY EVALUATIONS

As discussed in the FPH CPT/ROST Report (Clayton 2004), the majority of the petroleum hydrocarbon identified in the north Hartford investigation area, whether residual petroleum hydrocarbon (RPH) or FPH, is present at the surface of the saturated zone within the Main Sand and EPA Stratum. RPH is also encountered in the more permeable zones above the Main Sand, including the Rand and North Olive Strata. In addition, RPH is also often present in the smear zone of the Main Sand. Overall, the FPH CPT/ROST Report indicates the presence of either FPH or RPH was primarily found in the Main Sand or the more permeable zones within the overlying alluvium.

Data from the FPH CPT/ROST Report were further evaluated to identify the inferred depth to first encountered RPH. The results of the evaluation are presented in Figure 3-1. As shown by Figure 3-1, the inferred depth to first encountered RPH varies from 4 to 10 feet below ground surface (bgs) primarily in the northeast portion of north Hartford, to as deep as 30+ feet bgs at apparently isolated locations in the north central and south central portions of north Hartford. The majority of the inferred depths to first encountered RPH throughout north Hartford range from 10 to 20 feet bgs and 25 to 30 feet bgs.

The shallowest inferred depth to RPH (4 to 10 feet bgs) occurs primarily along North Olive Street, which is a petroleum pipeline corridor. As discussed in Section 2.0, the North Olive Stratum is the shallowest permeable stratum encountered within the alluvial silts and clays overlying north Hartford. The North Olive Stratum is generally encountered at depths ranging from 7 to 11 feet bgs along North Olive Street and extends to approximately 15 feet bgs along the majority of the street although it appears to reach approximately 20 feet bgs south of East Watkins Street. The North Olive Stratum is generally encountered at average depths ranging from approximately 11 to 14 feet bgs throughout its extents in Hartford. The RPH encountered within the North Olive Stratum is presented in Figure 3-2. As shown in Figure 3-2, the majority of the RPH identified

within the North Olive Stratum appears adjacent to the petroleum pipelines. The depth of the pipelines below ground surface along North Olive Street is approximately 12 feet; therefore, the lines appear to be located within the North Olive Stratum.

The Rand Stratum, as discussed in Section 2.0, is the permeable stratum underlying the North Olive Stratum within the alluvial silts and clays overlying north Hartford. The Rand Stratum is generally encountered at average depths ranging from approximately 19 to 25 feet bgs. The RPH encountered within the Rand Stratum is presented in Figure 3-3. As shown in Figure 3-3, the majority of the RPH identified within the Rand Stratum appears to be below the petroleum pipelines.

The EPA Stratum, as discussed in Section 2.0, is interpreted as more permeable than the overlying Rand Stratum and is an average of approximately 3 feet above the Main Sand. However, it appears less extensive throughout north Hartford than both the Rand and North Olive Strata. The EPA Stratum is generally encountered at average depths ranging from 31 to 38 feet bgs. The RPH encountered within the EPA Stratum is presented in Figure 3-4. As shown in Figure 3-4, the majority of the RPH identified within the EPA Stratum also appears to be below the petroleum pipelines, although the EPA Stratum is relatively limited in extent in north Hartford.

As discussed in Section 2.0, the areally extensive Main Sand has been identified by Clayton (2004) and others to be a highly permeable sand at an average depth of approximately 25 bgs. However, the depth to the Main Sand has been identified by the FPH CPT/ROST investigation to range from as shallow as approximately 9 feet bgs (HROST-60), in the southwestern portion of northern Hartford, to approximately 46 feet bgs (HROST-79) in the northeastern portion of northern Hartford,. The RPH encountered within the Main Sand is presented in Figure 3-5. As shown in Figure 3-5, the majority of the RPH identified within the Main Sand also appears to be below the petroleum pipelines.

4.0 SUMMARY OF ONGOING INVESTIGATIONS

Currently, Clayton and ENSR are conducting a variety of investigative activities in Hartford under the AOC that will provide information relevant to the infiltration of FPH and petroleum vapors into and/or along utilities and pipelines.

Clayton is involved in two investigative activities that will provide additional information regarding the impact of FPH and vapor infiltration upon Hartford. Clayton has submitted two documents to the Agencies, specifically the *FPH CPT/ROST™ Subsurface Investigation Report and FPH Monitoring Well and Soil Sampling Plan*, dated April 8, 2004 (FPH CPT/ROST Report) and the *Technical Memorandum Vapor Control System Upgrade Design*, dated May 6, 2004 (VCS Upgrade Tech Memo).

As discussed in the FPH CPT/ROST Report, a determination of the current extent of the FPH plume within Hartford is a prerequisite to enhancing the Conceptual Site Model (CSM) and designing an effective remedial approach. As stated in the January 7, 2004 Plan, an additional FPH field investigation to confirm and supplement the CPT/ROST investigation will be conducted. The additional investigation is also intended to address data gaps identified concerning groundwater flow patterns and the understanding of the geology and hydrogeology underlying the northern portion of Hartford. This investigation will consist of borings followed by installing monitoring wells at select locations and is primarily based on the observations and findings presented in the FPH CPT/ROST Report. The subsurface lithologies to be monitored are the North Olive Stratum, the Rand Stratum, the EPA Stratum, and the Main Sand unit. An individual monitoring well is anticipated to be installed within each of these units, where present. The proposed well locations are presented in Figure 3-6.

As presented in the VCS Upgrade Tech Memo, prior to installation of the new extraction wells, a series of vacuum monitoring points will be installed at select locations. Thirty

vacuum monitoring points have been proposed for the northern portions of Hartford. The subsurface lithologies to be monitored are the North Olive Stratum, the Rand Stratum, the EPA Stratum and the Main Sand unit. An individual monitoring probe will be installed (at each monitoring point) within each of these units, where present. The monitoring points have been preliminarily located at varying distances and directions from the proposed extraction well locations. The proposed monitoring point locations have been provided in Figure 3-7. At the time of preparation of this document, the work for the Clayton plans had not been fully approved by the Agencies.

Finally, ENSR is currently involved in ongoing activities to assess vapor migration through native soils and fill material and through utility corridors/lines in Hartford. As presented in the *Draft Initial Vapor Migration Pathway Assessment Report* (Draft Initial VMPA Report) prepared by ENSR and dated June 1, 2004, ENSR has conducted assessments at two properties, specifically, a residence at 507 North Olive Street and the Hartford Community Center located at 715 North Delmar Avenue (ENSR 2004). Using the information learned from these areas, ENSR is expanding the vapor migration pathway assessment to other areas.

In the opinion of Clayton, on behalf of the HWG, the results of the above investigations to be conducted by Clayton, the information contained within this document and that previously presented to the Agencies by ENSR, and the results of the further investigations to be conducted by ENSR, will provide information that will meet the intent of Paragraph 52 of the AOC. As a result, the HWG will not provide a deliverable in regard to this Work Plan and therefore has not included a schedule in this document. The data gained from implementation of the above-described work will be presented in specific reports identified in the AOC and deliverable to the Agencies under the schedule included in Appendix B of the AOC.

5.0 REFERENCES

Clayton Group Services, Inc., January 7, 2004. *Investigation Plan to Define the Extent of Free Phase and Dissolved Phase Hydrocarbons in the Village of Hartford, Illinois.* Clayton Project No. 15-03095.12.003.

Clayton Group Services, Inc., April 8, 2004. *FPH CPT/ROST™ Subsurface Investigation Report and FPH Monitoring Well and Soil Sampling Plan for the Village of Hartford, Illinois.* Clayton Project No. 15-03095.14.003.

Clayton Group Services, Inc., May 6, 2004. *Technical Memorandum Vapor Control System Upgrade Design Hartford, Illinois.* Clayton Project No. 15-03095.13.002.

Engineering-Science, Inc., March 1992. *History of Hydrocarbon Releases in the Village of Hartford, Illinois.*

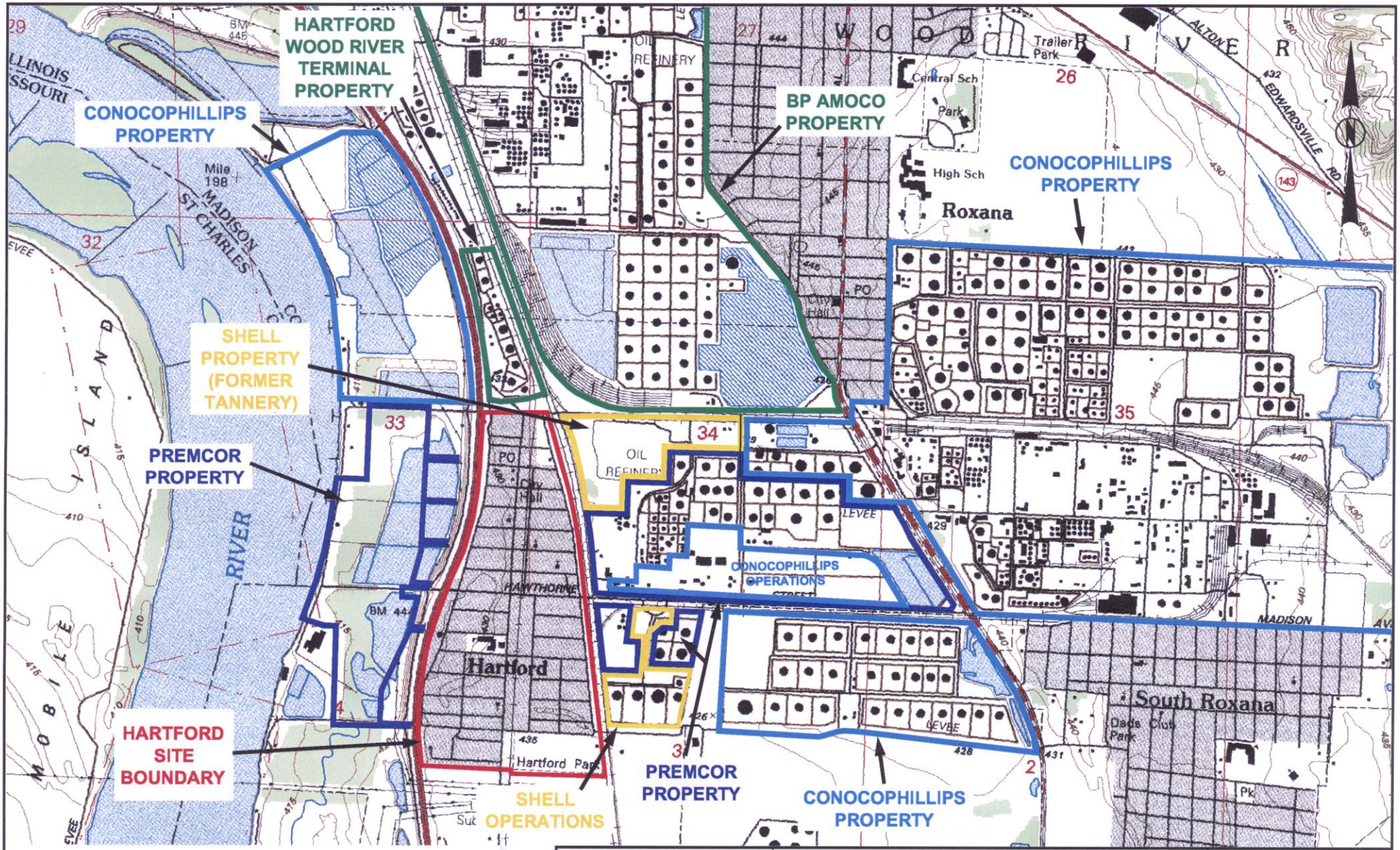
ENSR Corporation, June 1, 2004. *DRAFT Initial Vapor Migration Pathway Assessment Report.* ENSR Project No. 01005-093-350.

Illinois Environmental Protection Agency, November 1990. *Hartford Underground Hydrocarbon Investigation.*

United States Environmental Protection Agency, Region 5, Chicago, Illinois. *In the Matter of the Hartford Area Hydrocarbon Plume Site.* (Docket No. R7003-5-04-001).

FIGURES

FIGURES



** NOT TO SCALE **

SOURCE:
USGS 7.5 MINUTE SERIES TOPOGRAPHIC MAP
(WOOD RIVER, ILL.–MO. – rev.1994)

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DWN BY	BCP
DATE	6–24–04
SCALE	AS SHOWN
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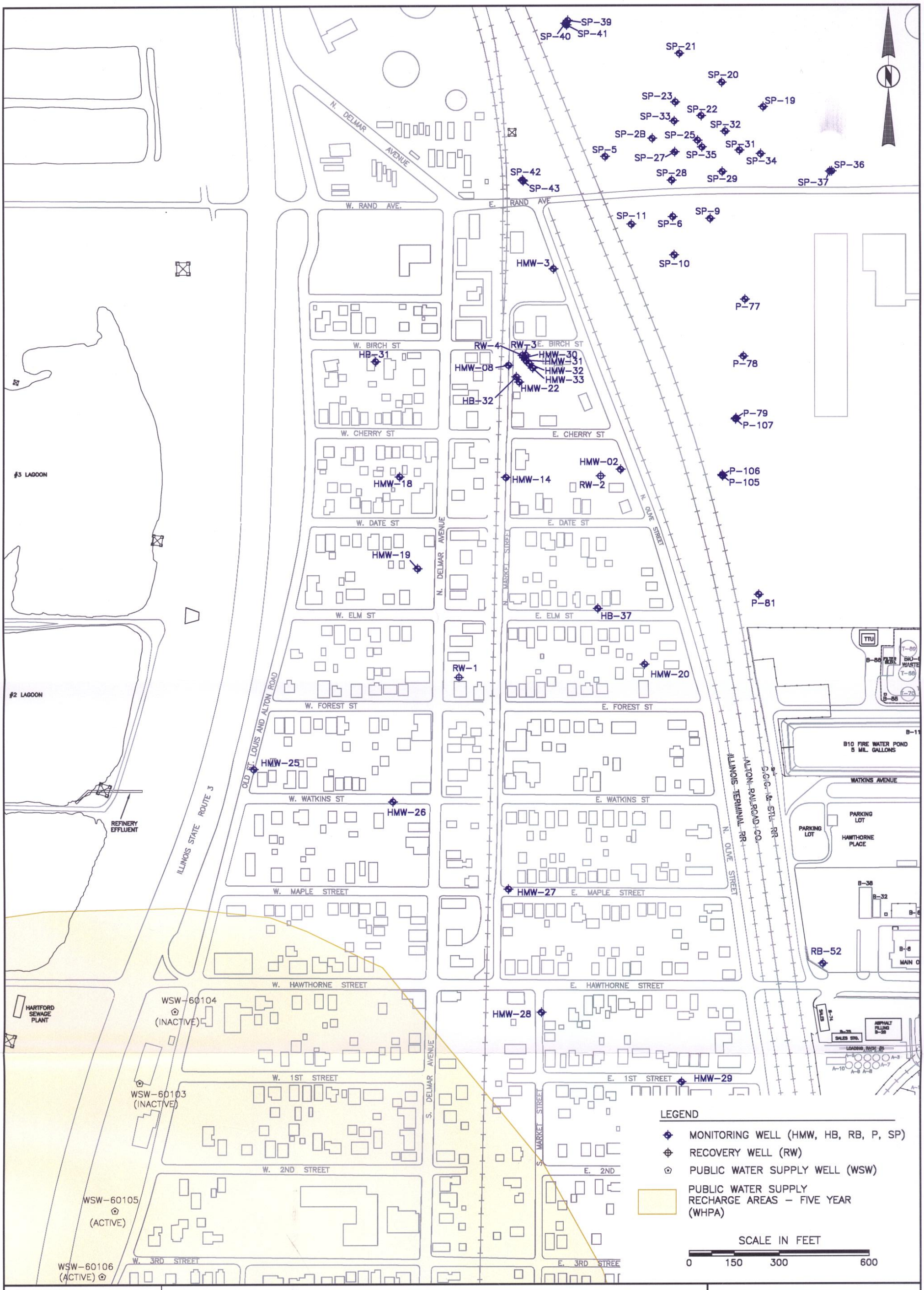
PRJ NO.	15–03095.12

VILLAGE OF HARTFORD, IL AND SURROUNDING AREA MAP

THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

Clayton GROUP SERVICES

FIGURE
1–1



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PRJ NO.	15-03095

NORTH HARTFORD SITE MAP
VILLAGE OF HARTFORD, IL

THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

Clayton GROUP SERVICES

FIGURE 2-1

PIPELINES AND INDUSTRIAL SEWERS
HARTFORD, ILLINOIS

Legend

- PIPELINES
- INDUSTRIAL SEWERS
- HARTFORD PUBLIC WATER WELLS

2002 Aerial Photography from
Madison County, IL GIS Department.

0 200 400 600 800 1,000 1,200 1,400 1,600 Feet

DATA SOURCES AND POSITIONAL ACCURACY NOTE
The pipelines and industiral sewers shown on this map are a compilation of various sources maps and figures.
This map is to be used for general refernce only.
No warranties as to the accuracy of the data present are given.

N:\Projermr\15-03095.10 Hartford Working Group\PDF Output\Figure 2-2.PDF

Figure 2-2
WORK IN PROGRESS
Edition Date: June 25, 2004

Clayton SM GROUP SERVICES

UTILITY AND PIPELINE MAP
NORTH PORTION OF HARTFORD, ILLINOIS

Legend

VILLAGE OF HARTFORD UTILITIES
- SANITARY SEWER MAIN
- FORCED SEWER MAIN
- WATER MAIN
- GAS MAIN

INDUSTRIAL PIPELINES AND UTILITIES
- PIPELINE
- INDUSTRIAL SEWER
- VAPOR-CONTROL-LINE

PROPERTY INFORMATION
- 755 Parcel Addresses
- Parcel Boundaries

PUBLIC WATER SUPPLY
- Municipal Wells

0 60 120 240 360 480 Feet

Map Notes:

Work in Progess. (06/24/04)

Base Map Source Data: 2002 Aerial photography and parcel data from Madison County, Illinois GIS Department

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VERSION: 040623-01

Figure 2-3

Clayton GROUP SERVICES SM

4–10 FT. BGS

10–20 FT. BGS

20–25 FT. BGS

25–30 FT. BGS

30+ FT. BGS

BGS = BELOW GROUND SURFACE

LEGEND:

- CPT/ROST™ INVESTIGATION LOCATION NO APPARENT PETROLEUM HYDROCARBON (BLACK)
- CPT/ROST™ INVESTIGATION LOCATION LIGHTER–RANGE PETROLEUM HYDROCARBON (BLUE)
- CPT/ROST™ INVESTIGATION LOCATION MID–RANGE PETROLEUM HYDROCARBON (GREEN)
- CPT/ROST™ INVESTIGATION LOCATION HEAVY–RANGE PETROLEUM HYDROCARBON (YELLOW)
- EXISTING MONITORING WELL
- RECOVERY WELL
- SENTINEL MONITORING WELLS
- 15 DEPTH IN FEET TO RESIDUAL HYDROCARBON
- PETROLEUM PIPELINE CORRIDORS (UNDERGROUND)
- INDUSTRIAL SEWER CORRIDOR (UNDERGROUND)

NOTES:

1. THE FOLLOWING HROST LOCATIONS 9, 18, 21, 32, 42, 46, 58, 59, 60,

SCALE IN FEET

0 125 250 500

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DATE	6–15–04
SCALE	AS SHOWN
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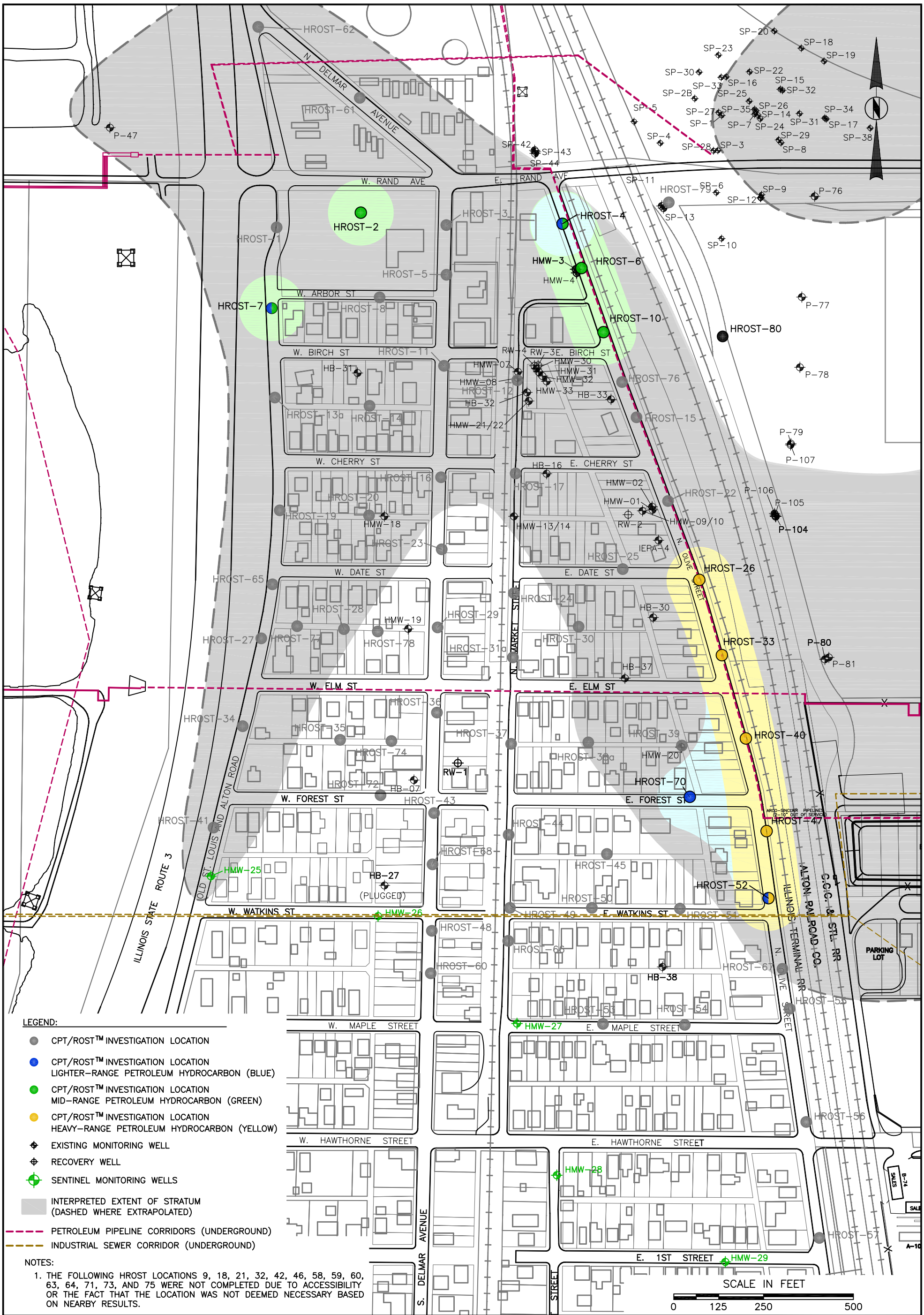
PRJ NO.	15–03095

INFERRED DEPTH TO FIRST ENCOUNTERED RESIDUAL PETROLEUM HYDROCARBON
(WORK IN PROGRESS – WILL BE UPDATED AS NEW DATA BECOMES AVAILABLE)
VILLAGE OF HARTFORD, IL

THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

Clayton® GROUP SERVICES

FIGURE 3–1



LEGEND:

- CPT/ROST™ INVESTIGATION LOCATION
- CPT/ROST™ INVESTIGATION LOCATION LIGHTER-RANGE PETROLEUM HYDROCARBON (BLUE)
- CPT/ROST™ INVESTIGATION LOCATION MID-RANGE PETROLEUM HYDROCARBON (GREEN)
- CPT/ROST™ INVESTIGATION LOCATION HEAVY-RANGE PETROLEUM HYDROCARBON (YELLOW)
- EXISTING MONITORING WELL
- RECOVERY WELL
- SENTINEL MONITORING WELLS
- INTERPRETED EXTENT OF STRATUM (DASHED WHERE EXTRAPOLATED)
- PETROLEUM PIPELINE CORRIDORS (UNDERGROUND)
- INDUSTRIAL SEWER CORRIDOR (UNDERGROUND)

NOTES:

1. THE FOLLOWING HROST LOCATIONS 9, 18, 21, 32, 42, 46, 58, 59, 60, 63, 64, 71, 73, AND 75 WERE NOT COMPLETED DUE TO ACCESSIBILITY OR THE FACT THAT THE LOCATION WAS NOT DEEMED NECESSARY BASED ON NEARBY RESULTS.

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DRAWN BY	BCP
DATE	6-15-04
SCALE	AS SHOWN
CAD NO.	0309514004G
PRJ NO.	15-03095.14

INTERPRETED EXTENT OF RESIDUAL PETROLEUM HYDROCARBON ENCOUNTERED IN THE N. OLIVE STRATUM (APPROXIMATE AVERAGE DEPTHS OF 11 TO 14 FEET (WORK IN PROGRESS – WILL BE UPDATED AS NEW DATA BECOMES AVAILABLE)
VILLAGE OF HARTFORD, ILLINOIS
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

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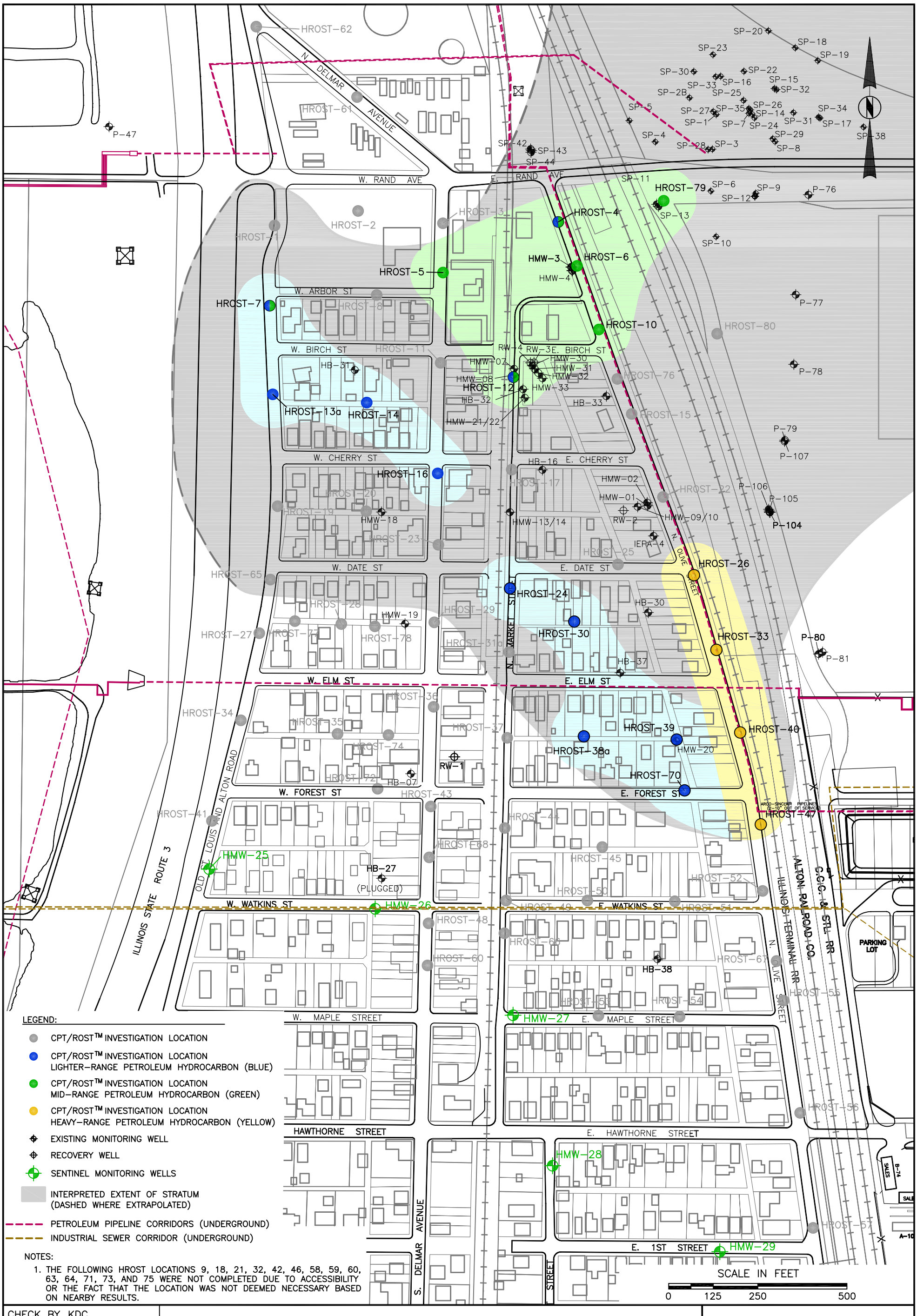
FIGURE 3-2



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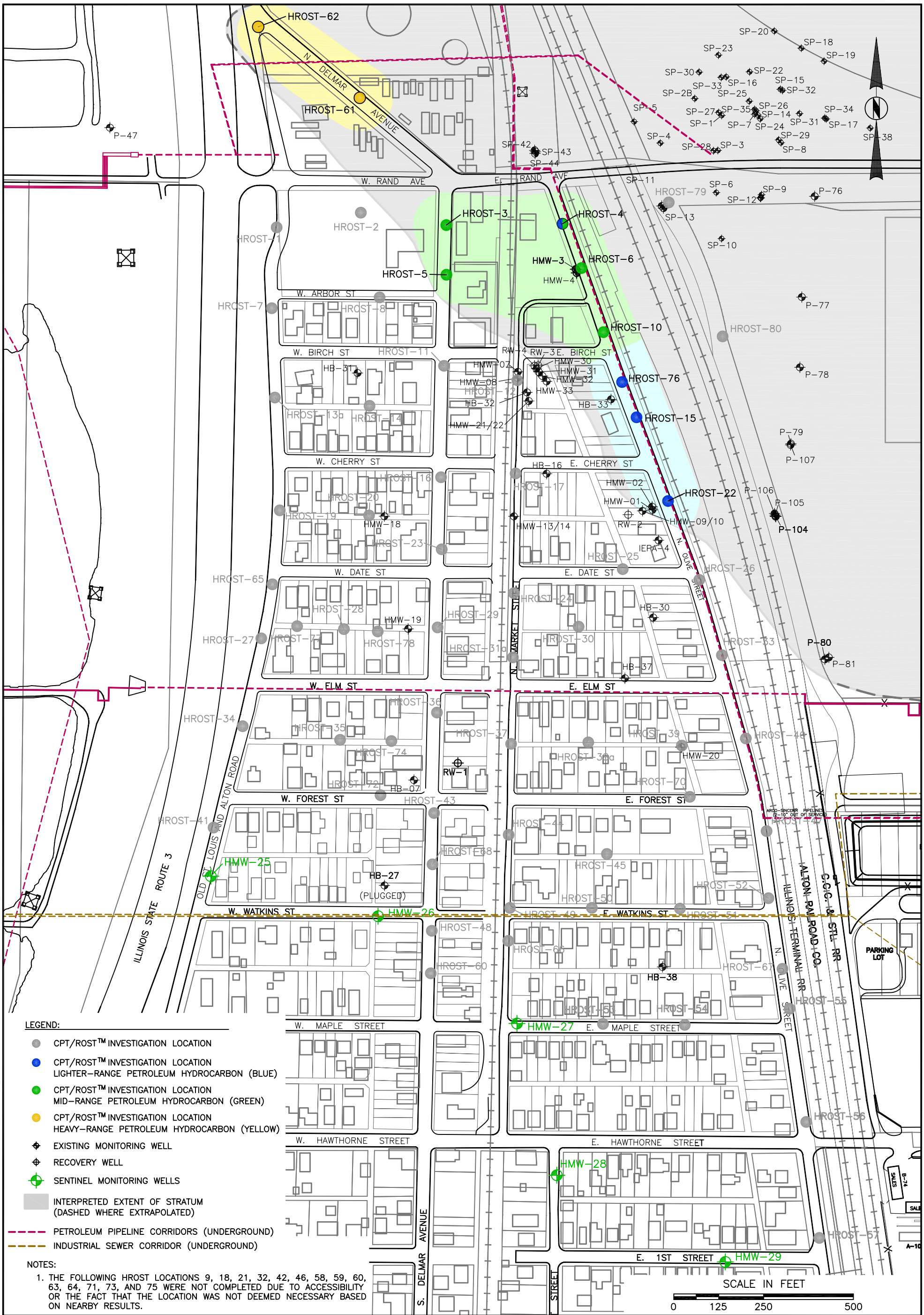
DRAWN BY	BCP
DATE	6-15-04
SCALE	AS SHOWN
CAD NO.	0309514004H
PRJ NO.	15-03095.14

INTERPRETED EXTENT OF RESIDUAL PETROLEUM HYDROCARBON ENCOUNTERED IN THE RAND STRATUM (APPROXIMATE AVERAGE DEPTHS OF 19 TO 25 FEET)
(WORK IN PROGRESS – WILL BE UPDATED AS NEW DATA BECOMES AVAILABLE)
VILLAGE OF HARTFORD, ILLINOIS
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

Clayton® GROUP SERVICES

FIGURE 3-3



LEGEND:

- CPT/ROST™ INVESTIGATION LOCATION
- CPT/ROST™ INVESTIGATION LOCATION LIGHTER-RANGE PETROLEUM HYDROCARBON (BLUE)
- CPT/ROST™ INVESTIGATION LOCATION MID-RANGE PETROLEUM HYDROCARBON (GREEN)
- CPT/ROST™ INVESTIGATION LOCATION HEAVY-RANGE PETROLEUM HYDROCARBON (YELLOW)
- EXISTING MONITORING WELL
- RECOVERY WELL
- SENTINEL MONITORING WELLS
- INTERPRETED EXTENT OF STRATUM (DASHED WHERE EXTRAPOLATED)
- PETROLEUM PIPELINE CORRIDORS (UNDERGROUND)
- INDUSTRIAL SEWER CORRIDOR (UNDERGROUND)

NOTES:

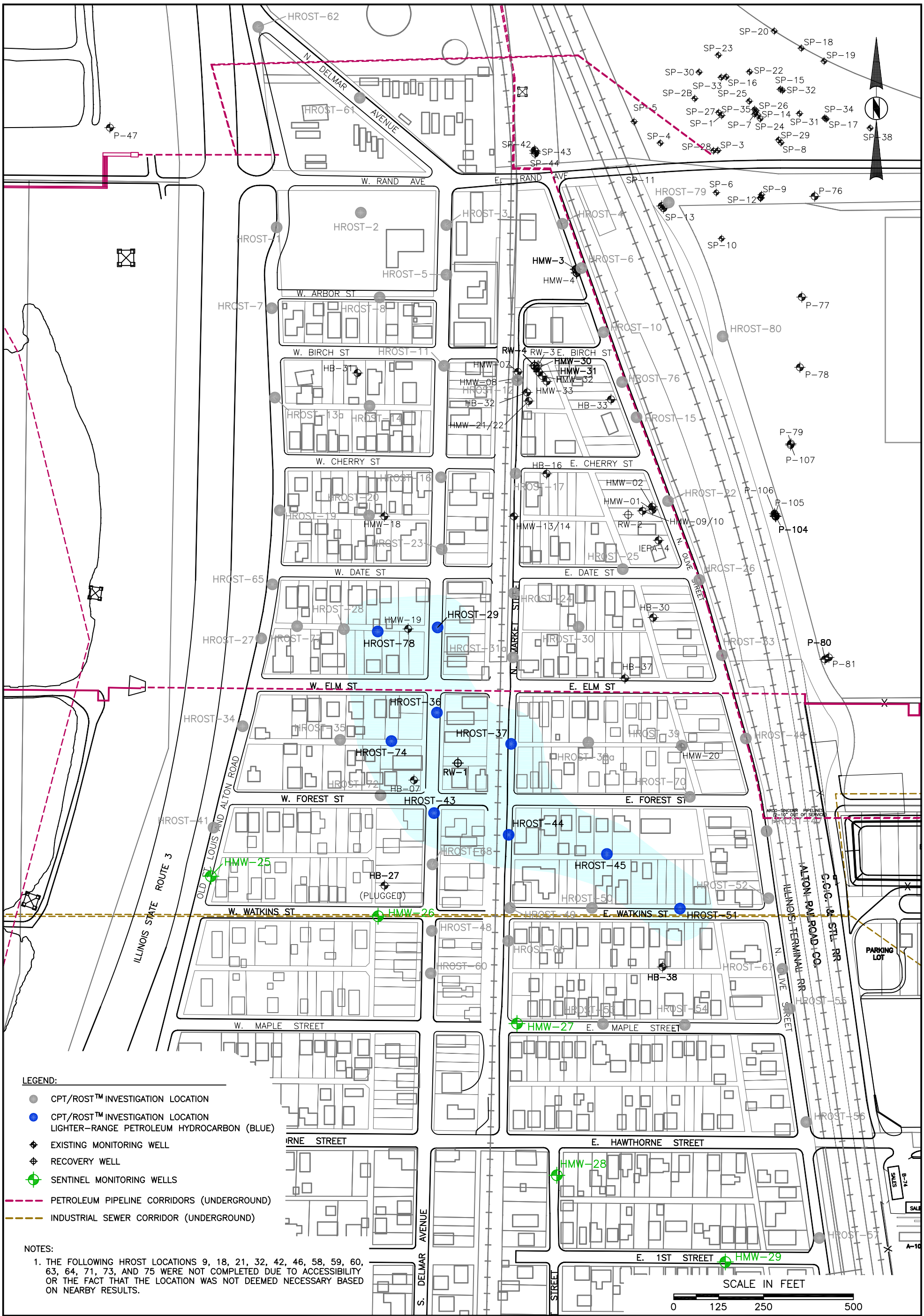
1. THE FOLLOWING HROST LOCATIONS 9, 18, 21, 32, 42, 46, 58, 59, 60, 63, 64, 71, 73, AND 75 WERE NOT COMPLETED DUE TO ACCESSIBILITY OR THE FACT THAT THE LOCATION WAS NOT DEEMED NECESSARY BASED ON NEARBY RESULTS.

CHECK BY	KDC
DRAWN BY	BCP
DATE	6-15-04
SCALE	AS SHOWN
CAD NO.	0309514004i
PRJ NO.	15-03095.14

INTERPRETED EXTENT OF RESIDUAL PETROLEUM HYDROCARBON ENCOUNTERED IN THE EPA STRATUM (APPROXIMATE AVERAGE DEPTHS OF 31 TO 38 FEET)
(WORK IN PROGRESS – WILL BE UPDATED AS NEW DATA BECOMES AVAILABLE)
VILLAGE OF HARTFORD, ILLINOIS
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

Clayton® GROUP SERVICES

FIGURE 3-4



LEGEND:

- CPT/ROST™ INVESTIGATION LOCATION
- CPT/ROST™ INVESTIGATION LOCATION LIGHTER-RANGE PETROLEUM HYDROCARBON (BLUE)
- EXISTING MONITORING WELL
- RECOVERY WELL
- SENTINEL MONITORING WELLS
- PETROLEUM PIPELINE CORRIDORS (UNDERGROUND)
- INDUSTRIAL SEWER CORRIDOR (UNDERGROUND)

NOTES:

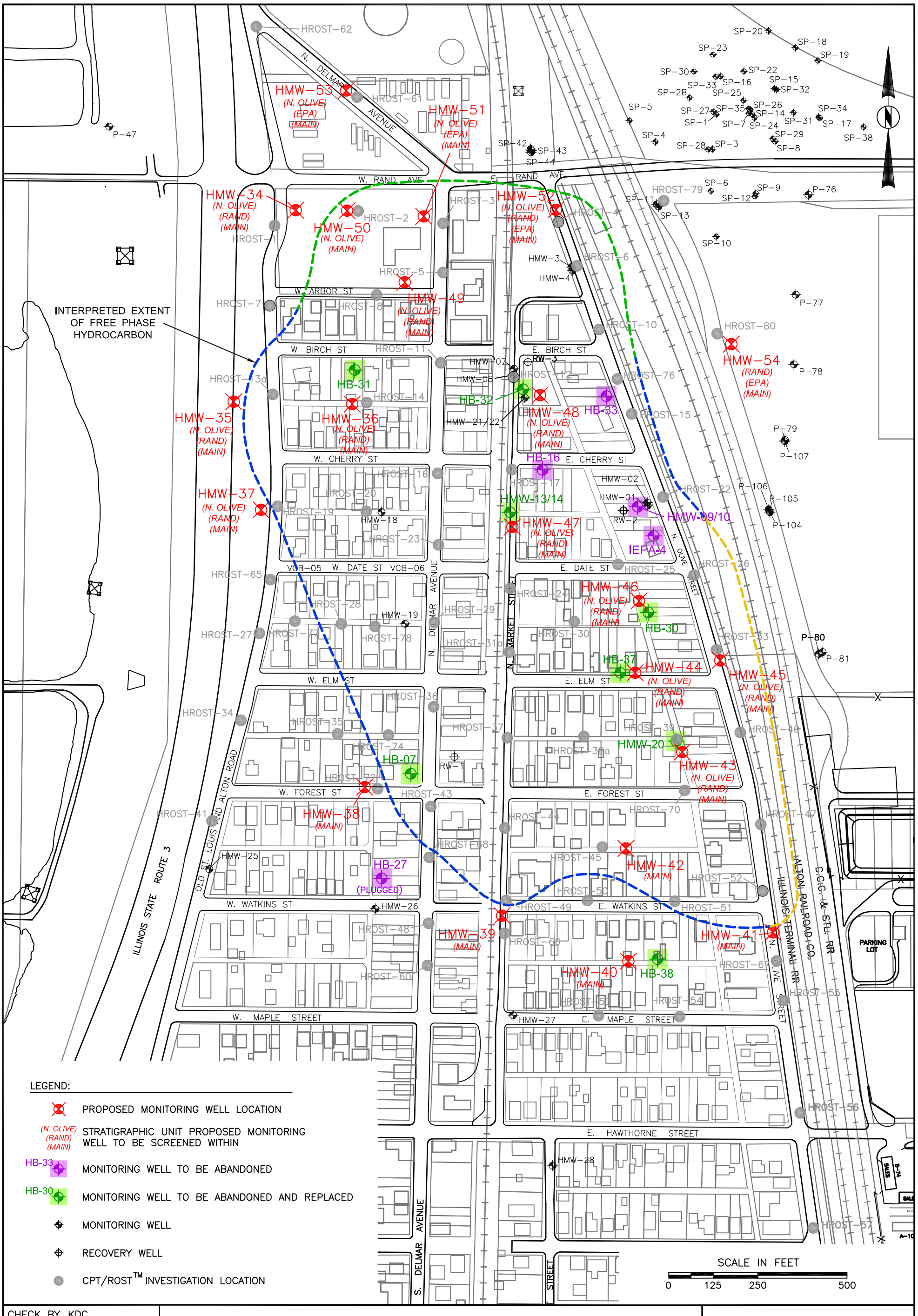
1. THE FOLLOWING HROST LOCATIONS 9, 18, 21, 32, 42, 46, 58, 59, 60, 63, 64, 71, 73, AND 75 WERE NOT COMPLETED DUE TO ACCESSIBILITY OR THE FACT THAT THE LOCATION WAS NOT DEEMED NECESSARY BASED ON NEARBY RESULTS.

CHECK BY	KDC
DRAWN BY	BCP
DATE	6-15-04
SCALE	AS SHOWN
CAD NO.	0309514004J
PRJ NO.	15-03095.14

INTERPRETED EXTENT OF RESIDUAL PETROLEUM HYDROCARBON ENCOUNTERED IN THE MAIN SAND (ABOVE 25 FEET)
(WORK IN PROGRESS – WILL BE UPDATED AS NEW DATA BECOMES AVAILABLE)
VILLAGE OF HARTFORD, ILLINOIS
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

Clayton® GROUP SERVICES

FIGURE 3-5



CHECK BY	KDC
DRAWN BY	BCP
DATE	6-15-04
SCALE	AS SHOWN
CAD NO.	0309514004K
PRJ NO.	15-03095.14

PROPOSED SOIL BORING / MONITORING WELL LOCATIONS MAP
VILLAGE OF HARTFORD, IL

THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

Clayton® GROUP SERVICES

FIGURE 3-6

CHECK BY	
DRAWN BY	BCP
DATE	6-24-04
SCALE	AS SHOWN
CAD NO.	0309513002D1
PRJ NO.	15-03095.13

PROPOSED MULTI-POINT
VACUUM MONITORING PROBE
LOCATION MAP

THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

Clayton GROUP SERVICES

FIGURE 3-7